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"Apollo Mission Highlights"

Draft/Bates 9/27/68

Suggested Remarks for Mr. Beggs

Presbyterian Church Group, Wayne, Pennsylvania

September 29, 1968 - 8:00 PM

Visited Phila

Dr Tom Paine

Revelation

Oct 4 1957 - Sputnik I
Apr 12 1961 - Major Yuri Gagarin

Oct 8, 1958
NAB A Act

A week from this coming Tuesday, the National

Aeronautics and Space Administration will celebrate its

10th Anniversary. The following week, if all continues

to go well, we will launch our first three-man Apollo

spacecraft in a manned earth orbital flight test. And

sometime within the next year or thereabouts, a similar

Apollo spacecraft will carry a team of American explorers

to the moon and back. This is really amazing progress when

you consider that a decade ago we were not even sure that

men could live in space.

Even so, we may not be the first to get there. I am

sure all of you saw the newspaper and TV coverage a few days

ago of the Soviet Union's outstanding engineering feat of

sending an unmanned spacecraft around the moon and landing

it safely back on earth.

4000
Museum
Sputnik - 1
Gagarin - 2
Apollo - 3

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But, you may ask, how important is all this to our country, or to us as private citizens? These are uncertain and complex times, not only for the national aeronautics and space program, but for virtually every important national activity.

To begin with, there are certain problems of communication which I can best illustrate by telling you a true story about a bishop who lived in Ohio before the turn of the century. To help make ends meet, he rented a room in his home to a young science teacher, and in the evenings they would have long discussions. The science teacher would explain to the bishop of the wonders to come. He told the bishop that a person in Ohio would soon be able to talk to someone in New York; that man would someday ride in automobiles at unbelievable speeds, perhaps even 35 miles an hour. In fact, he said, it was possible that man might someday fly.

At this point, the good bishop rather sternly took the young science teacher to task. What the young man

was saying was rank heresy, the bishop admonished, and he would listen to no more of such talk.

I tell this story for a particular reason -- the bishop had two sons; their names were Wilbur and Orville.

who told this story many times

I don't think, however, that today's citizens are

quite so blind to the promise of the future as was the good bishop. People today know that the benefits of science are very real, even though the specifics cannot always be predicted in advance. But many thoughtful citizens simply are not too sure about priorities in these difficult times of the Vietnam conflict, urban crisis, hunger, sickness, and all the other problems that concern

us all.

Seafaring countries - Port. Spain, England Holland

Accordingly, if there is any single point I would like to make as we meet together today, it is this: the dollars we are spending are not just being shot off into space; they are spent right here on earth, and are accomplishing many things -- a surprising number of which relate directly to the other problems we are trying so hard

*mercury
Graham
Cypello*

*Pres Kennedy
"we must say
this new sea
become a
seafaring
nation"*

*365
200
600
800*

*196,000
600,000
800,000
200*

*6,700,000,000
6,701,000,000
5,801,000,000*

to solve. The space program involves not just science and technology, but almost every form of ordinary business and professional activity. You may find it surprising, but only about 15 percent of the people working on the Apollo Program are scientists and engineers.

The space program has created and is helping to create new basic industries for our economy, at a time when increasing emphasis is being placed on programs to better our country through elimination of poverty, and greater attention to human welfare.

Some 20,000 private companies and research organizations have been directly participating in the space program. Thousands of companies in turn are selling goods and services to space-program companies, and untold thousands more are selling to people whose paychecks come from these companies.

From this you can plainly see the direct economic impact of the space program. Not quite so obvious, but just as real, are the more fundamental contributions of the program to the economic growth of the nation.

The entire civilian space program costs each American about 30 cents a week -- so it is surely not surprising that Dr. Willard F. Libby, distinguished Nobel Laureate and professor of chemistry at UCLA, said not long ago: "We have seen enough already to know that this program is one of the best bargains the American people have ever made."

Even more recently a report by a study group of the National Academy of Sciences had this to say:

"The potential economic benefits to our society from space systems are enormous. They may amount to billions of dollars per year to many diverse elements of our industry and commerce and thus to the general public."

The study group estimated that improved weather forecasting alone would be worth a billion dollars a year and that mineral and other earth resources revealed by specially instrumented spacecraft could amount to 2 billion dollars. It said that indirect benefits, for example, in

*Inspiration to youth
Our Space program is an open ended program*

education, will be even greater. I will touch further on all these points a little later.

The impact of the Space Age on education, for example, has been enormous. It is true that World War II had started a revolution in curriculum development, but America really woke up when the Russians orbited the first Sputnik. One result has been that we now find even elementary school students working with mathematical concepts that a few years ago were taught only in advanced college courses. Similarly, we have seen the advent of a new physics, a new chemistry, a new biology, and so on -- our generation can't even help the kids with their homework anymore!

The NASA program has also fostered a co-operative approach to research and problem solving. Today may be the age of the specialist, but with a program as complex as ours, we have to call upon the experts in many different lines of endeavor. The engineer works with the scientist. The industrialist consults with the economist. The

III Cost of program
cost of being second

IV Potential

A. Science (Keston, the oldest
orbiter & surveyors - 1000000 tons
better than best telescopes

2) Physics -

3) Biology - Human factors

4) Chemistry - weightlessness

5) Search for life - exobiology

B. Exploration
240,000 miles

1) moon & solar system

2) Alfa Centauri - flight years
25 x trillion miles
 $\times 10^{14}$

Venus 26,000,000
mars 49,000,000
jupiter 500,000,000

C. Applications on earth

1. Communications
2. Weather
3. Earth Resources
4. Direct TV

Show
Pictures

Texas
Instruments
RTS

mathematician works with the chemist and the biologist. And the professional manager fits the efforts of all these groups together. Sometimes there are some interesting combinations of know-how.

Not long ago, I ran across an article in Science magazine written by a professor of mathematics, electrical engineering, and medicine. What's so unusual about that, you might ask. Nothing, except the writer was one man.

One of the most important of the earthly benefits of the space program is new management techniques for large-scale problem-solving. The methods, skills and trained people being developed in the space program are already helping to solve many of the intricate problems in other sectors of national activity.

Several states, for example, have started programs to evaluate these techniques and apply them to such problems as urban transportation, air and water pollution, waste disposal, mechanized teaching, and paperwork and data management. Other promising areas include such matters

as nuclear desalinization of water, water resources management, urban planning and development, and high speed transportation systems, such as the rail link planned between Washington, D. C., and Boston.

NASA research is also giving the world important spinoff benefits in medicine and industry.

Hospitals are using space originated electronic equipment with which one nurse can monitor dozens of heart patients continuously from a central console. Many lives have already been saved and the number is growing daily. And the same techniques used to give clearer, sharper photographs of the surface of Mars are used to enhance the quality of X-ray photographs of the human body, particularly the cranium. Brain surgeons can now go into an operation with a far clearer idea of the difficulties they face.

Space vehicles require materials that can withstand great extremes of heat and cold, and that are very light without sacrificing strength or durability. Accordingly,

space research has developed many new materials that are now being used in commercial products here on earth.

Now I'd like to tell you a little more about our weather satellites, which NASA developed through its Tiros and Nimbus programs. The first experimental Tiros satellite was sent up in April 1960, and it gave us a totally new view and understanding of the world's weather. In the ensuing eight years, satellite pictures of clouds and other weather data have given us a global view of meteorological conditions affecting people everywhere in the world, both day and night.

Today the U. S. Environmental Science Services Administration is operating a regular satellite service for the Weather Bureau. These services are provided to more than 40 stations throughout the United States and also to some 47 foreign countries which have installed their own receiving stations.

Weather satellites have many times given early warnings of hurricanes and their probable courses, enabling

people in threatened areas to take cover. By preparing for these storms in time, lives have been saved and damage to property forestalled. The very first Tiros, for instance, revealed to weathermen a storm off our coast of which they had been totally unaware.

Future weather satellite systems will be much better than present-day systems; they may possibly even furnish the basis for long-range weather forecasting and play a role in developing techniques to modify and control the weather.

Another important benefit of space research is in communication. Most of us have watched pictures transmitted from Europe and Japan to our TV screens by our communications satellites, and the world is being drawn more closely together. We have even see TV pictures "live from the Moon," and every day we can read the notation on newscasts that the scenes brought into our homes are "via satellite."

We now accept the services of communications satellites as commonplace, but how many of us would have thought ten years ago that these would some day be possible? They are paying their way many times over.

Communications satellite systems will be even further improved by the work NASA now is carrying on. We can look forward not only to space communications for direct radio and TV broadcasting, but also to navigation aids for ships and commercial airliners; we will have improved air traffic control and safety, data collection and dissemination, and radio communications will be relayed from remote parts of the solar system to earth.

All the benefits of space research I have mentioned so far are clearly evident, but what about man in space? And more specifically, what about sending American explorers to the moon?

The moon is the visible goal; the real objective is to demonstrate true space flight capability beyond earth-orbital performance.

The moon presents specific requirements easily understood by space program managers, engineers, and scientists, that are technologically far beyond earth-orbit requirements. To achieve a lunar exploration mission by a manned

vehicle demands great advances in scientific knowledge and engineering over a broad spectrum of many disciplines.

It requires advanced techniques in management of industrial and research and development projects.

It calls for increased skills among welders, machinists and production workers.

It stimulates scientific and engineering education in our schools, and offers challenging research projects to thousands of scientists ranging from fundamental studies of life and man, to celestial mechanics and astronomy.

In conclusion Finally, much of my own great enthusiasm for space exploration is that I know if we can solve the problem of going to the moon, we can use these same techniques for solving problems here on earth. Working at the leading edge of science and technology we can help point the way for other new agencies such as Health, Education and Welfare, the Department of Transportation, Department of The Housing and Urban Development, in solving their big problems.

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I believe the space program and the knowledge and skills it has developed will make a powerful contribution to a better world for our children.

*Cost of program
1 of Henry Second*

The late Dr. Hugh Dryden, the world-famous scientist who played such an important role as Deputy Administrator of NASA until his death two years ago, was vitally concerned with these ideas. A man of deep religious faith, Dr. Dryden was an ordained minister and a Bible teacher at the Calvary Methodist Church in Washington, D. C., for most of his adult life. This great scientific mind found no conflict between science and religion. In one of his sermons, entitled "The Far Horizons," he said:

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"The horizons of our spiritual lives must be commensurate with the far horizons of our physical universe and of our intellectual and scientific accomplishments. In order to see the natural horizon around us it is necessary to rise above the ordinary level of things close to us. We must leave our ordinary surroundings and climb to the top of the hill or mountain, or better still climb

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into the atmosphere in a balloon or airplane. The higher we climb, the farther away is the horizon, and the farther we can see if the air is clear..."

Looking to the future, Dr. Dryden said:

"None of us know what the final destiny of man may be, or if there is any end to his capacity for growth and adaptation. Wherever this venture leads us, I am convinced that the power to leave the earth -- to travel where we will in space and to return at will -- marks the opening of a brilliant new stage in man's evolution."

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